JetNet 4510 / 4510-w

Industrial 10-port Managed Fast Ethernet Switch

RoHS

3 SFP Combo | SFP DDM | MSR < 5ms | MSTP

LLDP & JetView Pro | Private VLAN, QinQ | Modbus/ TCP | -25~70°C

- 7 10/100 Base TX and 3 RJ-45/SFP combo (10/100Base-TX, 100Base-FX)
- SFP ports support 100M Fiber with Digital Diagnostic Monitoring (DDM) to monitor long distance fiber quality
- Multiple Super Ring (recovery time <5ms), Rapid Dual Homing, Multiple Ring, and MSTP/RSTP
- VLAN, Private VLAN, QinQ, GVRP, QoS, IGMP Snooping V1/V2/ V3, Rate Control, Port Trunking, LACP, Online Multi-Port Mirroring
- 32Gbps Non-Blocking, 8K MAC address table
- Supports LLDP and JetViewPro i^{2}NMS software for auto-topology visualization and efficient group management
- Supports Modbus TCP/IP for Factory Automation
- Supports console CLI , Web, SNMP V1/V2c/V3, RMON, HTTPS, SSH for remote management
- Advanced security feature supports IP Security, Port Security, DHCP Server, IP and MAC Binding, 802.1x network access control
- Event Notification by E-mail, SNMP trap, Syslog, Digital Input and Relay Output
- Dual 12-48VDC power inputs
- IP31 rugged aluminum case
- Operating temperature -25~70°C for JetNet 4510, -40~70°C for JetNet 4510-w

Overview

JetNet 4510 is an industrial Managed Fast Ethernet Switch, designed with 7 10/100TX and 3 10/100 RJ-45 / 100FX SFP combo ports.

The 3 combo ports offer flexibility for additional fiber connections by plugging different types of 100MM SFP modules, which can support 2KM in Multi-Mode or 120KM in Single-Mode. The combo ports make port combination even easier, such as 8 RJ ports and 2 fiber ports, or 9 RJ ports and 1 fiber port. The standard 10 port Fast Ethernet switch greatly reduces total cost by up to 15% for fiber uplink network.

In addition to cost savings, the flexible design of the JetNet 4510 can adapt to the world's fastest Ring Technology by Korenix. It only takes 5ms to recover from link failure, no matter how many nodes are inside a ring. Moreover the restoration time is zero. The patented Multiple Super Ring provides most flexible ring topologies, such as shared link of multiple rings, or shared unit of multiple rings, making it the best possible. The Multiple Super Ring is highly compatible to Rapid Spanning Tree by the new Dual Homing plus design. JetNet 4510 also enhances security designs, such as SNMP V3, SSH, 802.1X, etc.

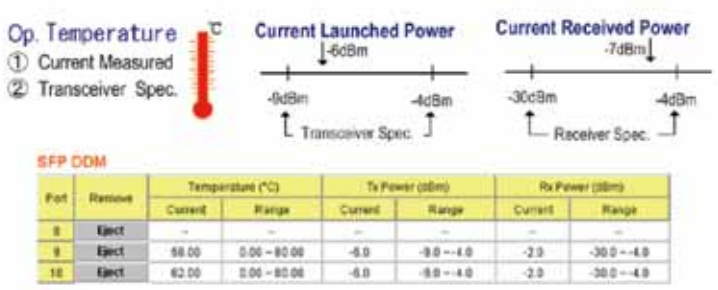
3 Flexible Fast Ethernet Combo Ports

The JetNet 4510 is designed with three combo Fast Ethernet ports. Each combo port combines one Small Form factor Pluggable (SFP) socket for 100Mbps multimode or single mode SFP transceiver, as well as one RJ-45 copper port in 10Mbps full duplex, 100Mbps half /full duplex link mode.

The switch will automatically detect the priority of cable connections for each combo port. Users are able to connect two 100Mbps SFP ports of JetNet 4510 as a Fast Ethernet Fiber Redundant Ring topology and the third combo port as a fiber uplink port or an applicable port.

100Mbps DDM SFP transceiver for High Quality Monitoring

The JetNet 4510 Series SFP socket supports 100Base-FX single-mode/multi-mode transceiver with speed detection and independent indication. Moreover, it supports DDM (Digital Diagnostic Monitoring) type SFP transceivers allowing users to diagnose optical cable transmission problem through maintenance and debugging of the optical signal quality by DDM without the need of an extra optical cable analyzer as a result greatly saving time and system costs.



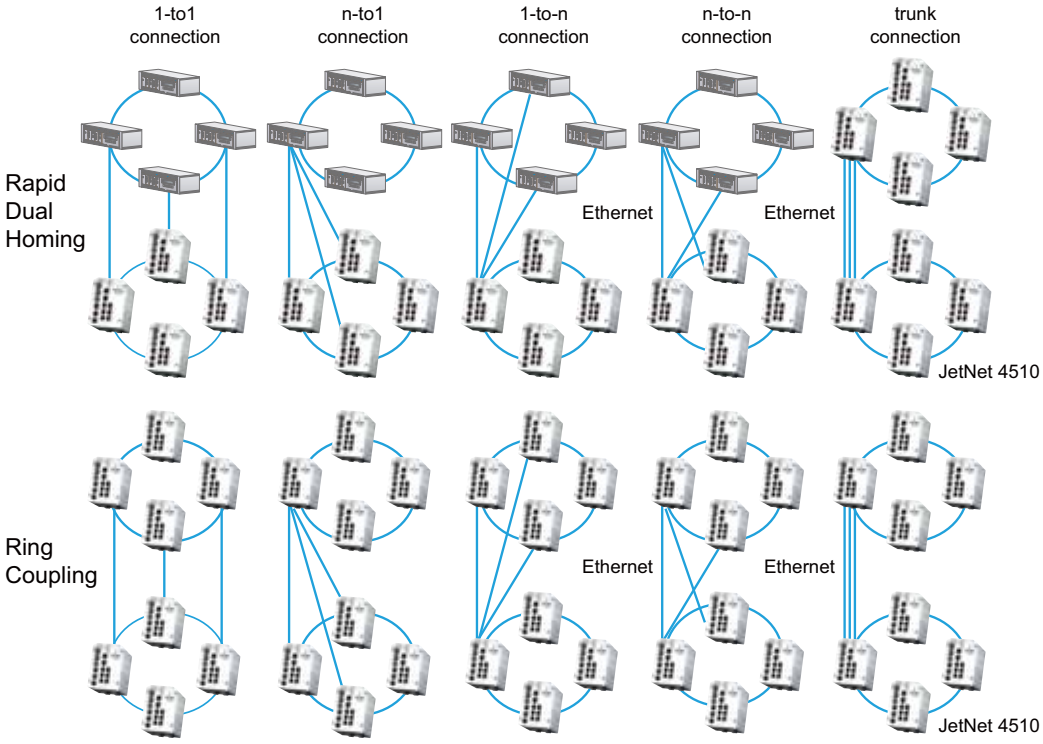
Comprehensive Redundant Solutions — Multiple Super Ring (MSR™)

The JetNet 4510 supports MSR™ (Multiple Super Ring) the next new generation of RSR (Rapid Super Ring) Ring technology. This new technologies is perfect for different network redundancy applications and structures. The JetNet 4510 allons aggregating up to 5 Fast Ethernet rings, including 1 Fiber ring for long distance data transmission. With the MSR™ technology, a node can be configured to multiple rings with the failover time in as little as 5ms and ZERO-second restore time. In addition, users can extend the ring topology by adding hundreds of JetNet 4510 to meet the network needs without compromising the speed of the network.

The MSR™ also facilitates the JetNet 4510 to connect with core management switch via standard Rapid Spanning Tree Protocol or through multiple paths or nodes to increase the reliability by Rapid Dual Homing (RDH™) Technology. By integrating MSR™ and Link Aggregation Control Protocol (LACP) the JetNet 4510 can enhance the link availability and to increase the link capacity. Two or more Fast Ethernet connection are bundled in order to increase the bandwidth and to create resilient and redundant links.

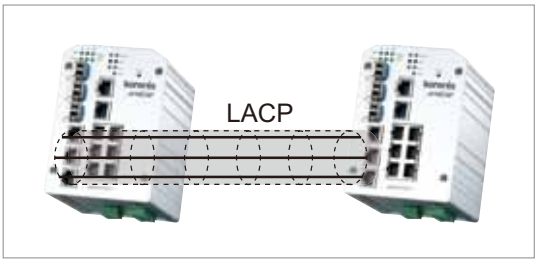
Rapid Dual Homing (RDH™) Technology

Rapid Dual Homing (RDH™) replaces DualHoming II and can be used for ring coupling. While keeping easy configuration and multiple redundancies, the failover time is much faster (less than 50 ms) and the restore time is ZERO (seamless restoration). Uplinks can be auto detected and gathered into groups. In each group, uplinks are sorted into Primary, Secondary, and Standbys by their link speed. The uplink with the highest speed is more likely to be the active path for data transmission. Link aggregation is also integrated into RDH™. An uplink can be a link or several links aggregated as a trunk, which provides better redundancy and link capacity.



Link Aggregation Control Protocol

Link Aggregation Control Protocol (LACP) allows you to group multiple Ethernet ports in parallel to increase the link bandwidth. The aggregated ports can be considered one physical port, so that the bandwidth is higher than just one single Ethernet port. The member ports of the same trunk group can balance the loading and backup with each other. The LACP feature is usually used when you need higher bandwidth for the backbone network. This is an inexpensive way for users to transfer much more data. If the trunk port is also assigned as a ring port, it will become a TrunkRing™, which means that the bandwidth of ring path has increased with port trunk technology. Now, there is no recovery time when failures occur. The JetNet 4510 provides a simple and easy way to aggregate port bandwidth into Rapid Super Ring.



Various Network Control and Security Features

The JetNet 4510 provides various network control and security features. The Network Control feature allows users to optimize their industrial environment. The supported features include VLAN, IGMP Snooping, Quality of Service(QoS), Link Aggregation Control Protocol (LACP), Rate Control. The security can help users avoid hackers' attack. The features include DHCP Server, IP and MAC Binding, 802.1x Access Control, SSH, IP Access Table and Port Security.

LLDP and JetView Pro i^{2}NMS for Auto Topology Visualization

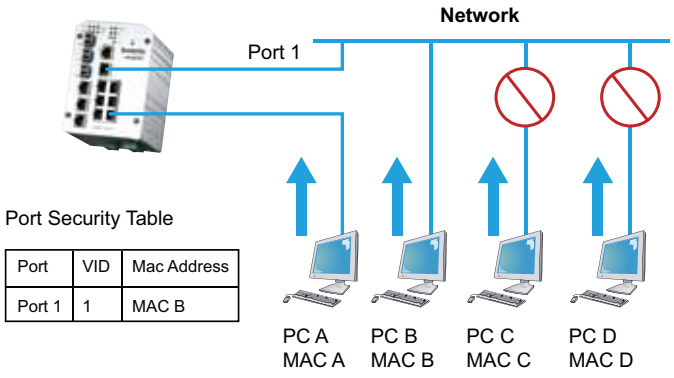
The Link Layer Discovery Protocol (LLDP) was formally ratified as IEEE 802.1AB-2005. LLDP is the Layer 2 protocol that allows the network device/station to advertise connectivity & management information, the identity & major capabilities. If receives and establishes network management information on the local same network.

In industrial environments, most vendors provide their own discovering protocols, window utility or other tools to manage their switches. The LLDP protocol fixes the interoperability among them. With LLDP supported, users can easily browse the network devices and establish the network management information schema of the stations.

With SNMP, LLDP and JetView protocols supported, JetNet 4510 series can be easily discovered, their port and ring status can be displayed by JetView Pro, the Korenix designed Network Management System or other NMS, which supports SNMP and LLDP. The software can help administrators efficiently and effectively manage the industrial network.

Port Security

Port Security is an enhanced security feature provided by JetNet 4510. Port Security is also known as, "Port and MAC Binding". Users can bind a specific MAC address to a specific port, add the MAC and Port binding entry/entries to the port security table. After enabling this, only the PC with the available MAC address can access the network through the switch. The other PCs can't even pass the traffic through the port.

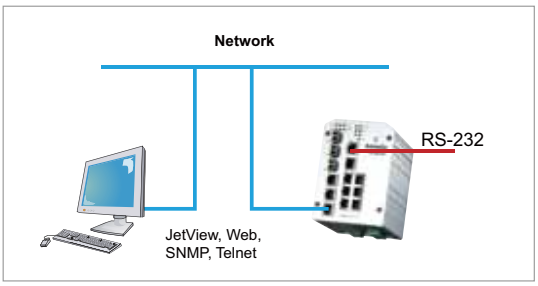


Port Security Table

Port	VID	Mac Address
Port 1	1	MAC B

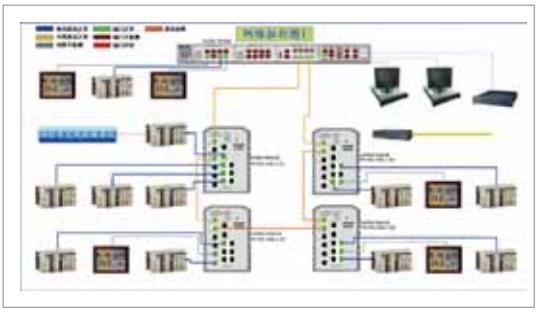
Easy-to-Configure Network Management Features

The JetNet 4510 also provides users many advanced management features. It can be configured smartly by JetView, JetView Pro, Web browser, SNMP, Telnet and RS-232 console Command Line Interface (CLI).
It provides Failure notification by E-mail, SNMP Trap, System Log, Digital Input and Fault Relay. The JetNet 4510 also supports Built-In Watchdog Timer for system recovering when detecting CPU failure.



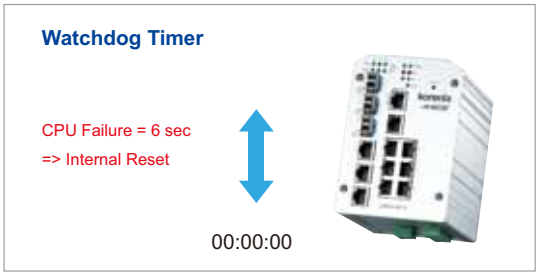
Modbus TCP/IP for Factory Automation Network Enhancement

The Modbus TCP/IP protocol is supported in JetNet 4510 series for factory automation applications. It enables administrator to connect to data acquisition (SCADA) system and read the switch's operating information using its own Modbus TCP/IP master program for monitoring and maintaining switch's status. With the supported Modbus TCP/IP, the JetNet 4510 series become an element of factory automation such as the Programmable Logic Controller (PLC), Distributed Control System (DCS), and allow users to monitor/ maintain factory equipment on the HMI (Human Machine Interface) system, including production information and communication status. Therefore, user does not need to integrate multiple management platforms to monitor factory equipment: with just a single JetNet 4510 platform users can easily achieve enhanced monitoring and maintenance of the entire factory.



A Built-in Watchdog Timer

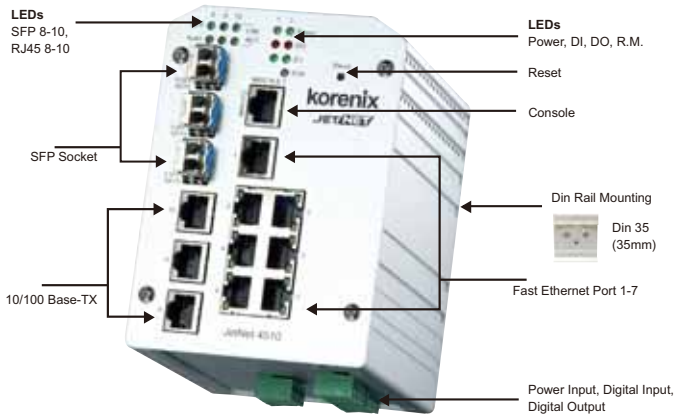
With a built-in Watchdog timer, the JetNet 4510 performs a warm boot (restarting the switch) automatically when the switch system locks up. It saves the effort of maintenance for keeping network alive if the switch can recover by itself.



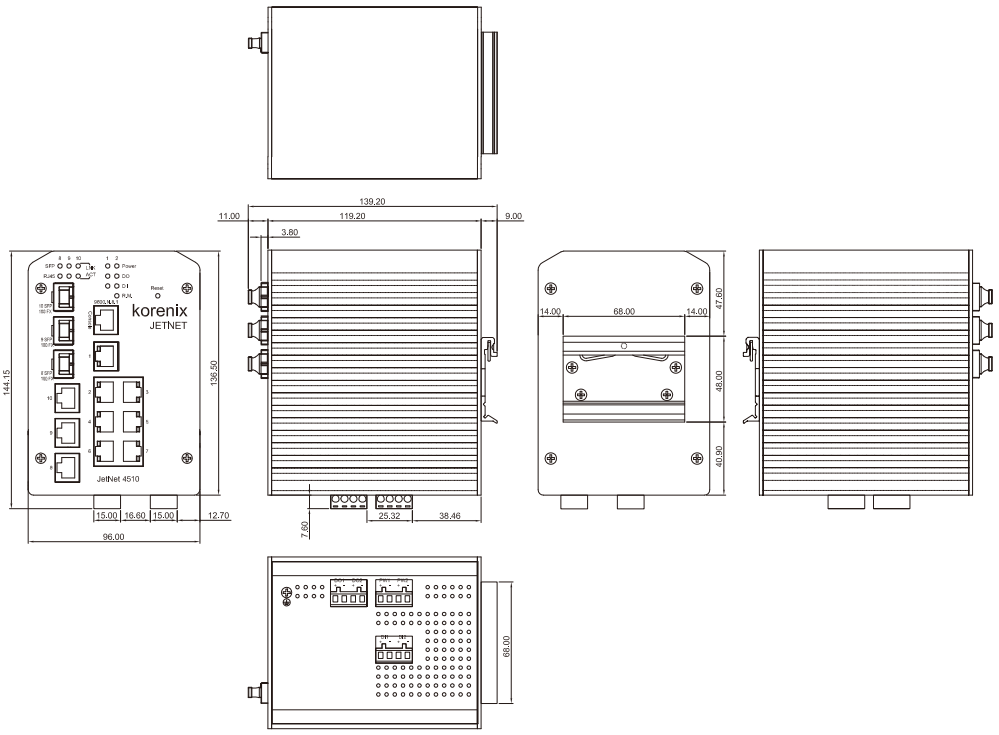
Brilliant Idea for Hazardous Environment Application Robust Mechanical Design

Korenix JetNet 4510 has an outstanding outlook plus is rock solid with strong functionality. Using an aluminum extrusion case with IP 31 class of protection, light weight, rigid shell and excellent thermal conductivity units, it can operate reliably under harsh industrial environments.

JetNet 4510 Appearance



Dimension (Unit = mm)



Specification

Technology

Standard:
IEEE 802.3 10Base-T Ethernet
IEEE 802.3u 100Base-TX Fast Ethernet
IEEE 802.3u 100Base-FX Fast Ethernet
IEEE 802.3x Flow Control and Back-pressure
IEEE 802.1p class of service
IEEE 802.1Q VLAN and GVRP
IEEE 802.1QinQ
IEEE 802.1D-2004 Rapid Spanning Tree Protocol (RSTP)
IEEE 802.1s Multiple Spanning Tree Protocol(MSTP)
IEEE802.3ad LACP
IEEE802.1X Port_based Network Access Control
IEEE802.1AB Link Layer Discovery Protocol
Modbus TCP/IP

Performance

Switch Technology:
Store and Forward Technology with 32Gbps Switch Fabric
System Throughput: 2.976Mpps/ 64bytes packet
Transfer packet size: 64 bytes to 1522 bytes (with VLAN Tag)
MAC Address: 8K MAC
Packet Buffer: 1Mbits
Relay Alarm: Dry Relay output with 1A@24V ability

Management

Configuration: Cisco-Like CLI, JetView, Web browser with multiple languages, HTTPS, SSH; TFTP/Web Update for firmware and configuration backup/restore, DHCP Client, Warm reboot, Reset to default, Admin password, Port Speed/Duplex control, status, statistic, MAC address table display, Static MAC, Aging time
SNMP: v1, v2c, v3, Traps and RMON1
LLDP: Link Layer Discovery Protocol to advertise system/port identity and capability on the local network
SNMP MIB: MIB-II, Bridge MIB, VLAN MIB, SNMP MIB, RMON and Private MIB
Port Trunk: Up to 5 Static Trunk and 802.3ad LACP
VLAN: IEEE802.1Q VLAN, GVRP. Up to 256 VLAN groups
Private VLAN: Direct client ports in isolated/community VLAN to promiscuous port in primary VLAN
QinQ: Double VLAN Tag in an Ethernet frame
Quality of Service: Four priority queues per port, IEEE802.1p COS and Layer 3 TOS/DiffServ
IGMP Snooping: IGMP Snooping V1/V2/V3 for multicast filtering and IGMP Query V1/V2
Rate Control: Ingress filtering for Broadcast, Multicast, Unknown DA or All packets, and Egress filtering for All packets
NTP: Network Time Protocol to synchronize time from internet or local PC
Embedded Watchdog: Embedded hardware watchdog timer to auto reset system when switch system failure
Port Mirroring: Online traffic monitoring on multiple selected ports
Port Security: Assign authorized MAC to specific port
IP Security: IP security to prevent unauthorized access
802.1x: Port_based Network Access Control
Radius: Login by Radius account/password, Key for Radius Server Authentication
DHCP Server: Up to 255 IP address, support IP and MAC binding
DHCP Option 82: Relay the DHCP request
E-mail Warning: Automatic warning by pre-defined events
System Log: Supports both Local mode and Server mode
Modbus TCP/IP: Supports open protocol- Modbus TCP/IP with function code group 4 for factory automation application

Network Redundancy

Multiple Spanning Tree Protocol: IEEE802.1s MSTP, each MSTP instance can include one or more VLANs
Rapid Spanning Tree Protocol: IEEE802.1D-2004 Rapid Spanning Tree Protocol. Compatible with Legacy STP and IEEE802.1w
Multiple Super Ring(MSR™): 2nd generation Korenix Ring Redundancy Technology. Failure recovery within 5ms.
Rapid Dual Homing (RDH™): Support multiple node to node, multiple path to one node to obtain more flexible and reliable architecture
TrunkRing™: Provides port aggregate function in ring path to get more bandwidth for higher throughput ring architecture
Multiple Ring: New generation of ring coupling technology without extra control port - TangentRing
Legacy Super Ring: Backward compatible in client mode

Interface

Number of Ports: 10/100TX: 7 x RJ-45, Auto MDI/MDI-X, Auto Negotiation
10/100TX: 3 x RJ-45, combo with SFP
100Base-FX: 3 x SFP with Hot Swappable
Cables:
10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable (100m)
100 Base-TX: 2/4-pair UTP/STP Cat. 5 cable (100m)
Diagnostic LED:
10/100 RJ-45: Link/Activity(Green), Full duplex/Collision (Yellow)
SFP: Link/Activity(Green)
Unit: Power(Green), Digital Out(Red), Digital Input(Green), R.M.(Green)
RS232 Console: RJ-45 Connector, Pin3: TxD, Pin6: RxD, Pin5:GND
Power: 2 sets of power Inputs
Digital Input: 2 sets of Digital Input
Logic Low (0): 0-10VDC/Logic High(1): 11-30VDC
Alarm: 2 sets of Relay outputs for pre-defined events
Reset: Reset button is provided to restore default settings

Power Requirements

System Power: 12~48V/-12~-48VDC with Reverse Polarity Protection (JetNet 4510 / 4510-w)
Power Consumption: 11.5 Watts @ DC 48V

Mechanical

Installation: DIN-Rail mount or Wall Mount
Case: IP31 protection, aluminum metal case
Dimension: 137mm(H) x 96mm (W) x 119mm (D) (without DIN rail clip)
Weight: 0.915kg with package

Environmental

Operating Temperature: -25 ~70°C (JetNet 4510), -40 ~70°C (JetNet 4510-w)
Operating Humidity: 5% ~ 95% (non-condensing)
Storage Temperature: -40 ~ 85°C (-40 ~ 185°F)
Hi-Pot: 1.2KV for power
1KV for ports

Regulatory Approvals

EMI: EN55022 CLASS A, EN61000-3-2, EN61000-3-3, EN61000-6-4
EMS: EN55024, EN61000-6-2, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8
Safety: UL 508
Shock: IEC60068-2-27
Vibration: IEC60068-2-6
Free Fall: IEC60068-2-32
MTBF: 249,683 Hours, MIL-HDBK-217F GB GB(MILITARY HANDBOOK)standard
Warranty: 5 years

Ordering Information

JetNet 4510 Industrial 10-Port Managed Fast Ethernet Switch, -25~70°C operating temperature

JetNet 4510f Industrial 10-Port Managed Fast Ethernet Fiber Switch, -10~70°C operating temperature

JetNet 4510-w Industrial 10-Port Managed Fast Ethernet Switch, -40~70°C operating temperature

Includes:

- JetNet 4510 / 4510f / 4510-w (without SFP transceiver)
- Wall mounting plate
- Quick Installation Guide
- Documentation CD-ROM
- Console cable

Optional Accessories

100Base-FX SFP Transceiver

100Base-FX BIDI/WDM SFP Transceiver

100Base-FX SFP Transceiver with DDM

100Base-FX BIDI/WDM SFP Transceiver with DDM